Engaging Students by Efficiently Monitoring Attendance and Participation

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Abstract

James Cook University is faced with a number of challenges in first year transition, which is exacerbated by the number of equity groups represented. This is made even more challenging in the bachelor of engineering, which is perhaps the most challenging degree program on offer. The development of an automated system for monitoring lecture attendance and gauging participation in on-course assessment is presented. This system could play a role in supporting institution-wide intervention and support initiatives, since non-attending students can be quickly and efficiently identified.

Background and motivation

JCU is a regional university with approximately 10,000 enrolled undergraduate students. Commencing students for 2006 indicated a high proportion of equity target groups, including 50% from rural and remote locations, and over 20% from low socio-economic status. This is even more challenging in the Bachelor of Engineering course, where completion rates (number of student who graduate the course divided by number of students who commenced 4 years prior) are traditionally less than 50%.

In 2008 the First Year Experience Project at JCU (Anon. 2008) identified a number of issues relevant to our first year student body, notably student engagement and participation. Krause, Hartley, James & McInnis (2005, p. 32) underline the importance of on-campus attendance in this regard.

> *Despite the introduction of various communications technologies, there remains a strong argument in favour of the link between students' attendance on campus and their involvement with and integration into the learning community. Our findings support this argument, showing that students who spend fewer days on campus are also those least likely to ask questions in class and contribute to class discussions. ... First year students who spend more time on campus are also significantly more likely to report that they feel as if they belong and are part of the learning community than those who spend fewer days per week on campus.*

This submission posits that front-line support (i.e. direct contact from the lecturer) is a highly effective way to assist students in developing their academic and time management skills. This is particularly important for those students at risk and students who are highly disengaged from the academic process. James, Krause, and Jennings (2010, p. 6) state that

> *there is perhaps no greater challenge facing the sector than that of identification and monitoring the students who are 'at risk' of attrition or poor academic progress. ... Overall, the problems of students at risk and students who are disengaged require institutions to have good data systems in place.*

While there are examples of institution-wide support systems for first year students (Carlson and Holland, 2009), the responsibility for taking attendance is typically left with the

academic in charge of the subject, which means that it is often not undertaken. It is proposed that an efficient system for taking attendance and gauging participation at the unit level would be welcome.

73.2% of JCU undergraduate students identified part/time casual work as a source of income, only 15.4% identified that paid work commitments was an important factor in deciding whether to discontinue/defer their course. As a result, it was felt that University demands could be made more explicit to these students, so that there was no question as to what was expected. This again falls in line with James et al. (2010, p. 6) who suggest that Australian institutions of higher learning need to clearly spell out the expectations of higher education study. Thus an important aspect of this project was to inculcate a culture of attendance in our first-year engineering cohort.

This nuts and bolts session offers a practical way to generate the primary data necessary to determine those students who are making poor academic progress and are thus a risk of attrition.

Monitoring attendance and participation

The following sections outline the context of the problem, development of an automated solution and roll-out of the system.

Context of the problem

The engineering program at JCU has about 175 entry students each year at the Townsville campus. All engineering students take the same subjects as part of their common first year program, including the prosaically named *EG1000:03 Engineering 1*. Engineering students arrive with the notion that engineering is all about numbers. However, this subject delivers critical content related to engineering in society, sustainability, team work and communication. As a result, it was traditionally poorly attended.

Taking the role, while an effective way of increasing attendance, was infeasible given the number of students involved and was soon abandoned. Even if the role were taken, this would not address the issue of student participation in their weekly task. This problem was tackled as an engineering design problem that aimed to develop a fast and accurate system for capturing student attendance and, more importantly, participation in the subject.

Development of student identification stickers

Over a number of years a system was developed based on electronic scanning of each student's identification number. The first step was to create a sheet of 45 stickers, each containing the student's name, group affiliation and bar-coded student identification number as pictured in Figure 1.

Figure 1 – student identification sticker.

The identification sticker sheets were produced by arranging the necessary data (surname, given name and identification number) in Microsoft Excel using a custom-made macro.

These data were then imported into Word using its mail merge functionality. The identification number above is presented using the codabar barcode font. The above sticker can be electronically "read" with a commonly available barcode scanner that plugs into a computer's USB port and requires no software installation.

Implementation

At the first EG1000 lecture, students are informed of the University's interest in assisting them in their transition to higher education, no matter their educational, social or cultural backgrounds. It is made very clear to these students that a lack of attendance is often a strong predictor of failure in many, if not most, engineering subjects.

Students are also informed that they must fully participate in the program; firstly, as a requirement of our external accreditation and, secondly, since it will assist them to be better prepared for end-of-semester examinations.

They are then informed of the expectation that they attend *every* scheduled session in EG1000, including all lectures, tutorials and practicals. They are then issued with a sheet of 45 duplicate stickers and told to bring them to *every* EG1000 session. They are also instructed to attach a sticker to each item of assessment, which are typically issued on a weekly basis and due the following week.

Gauging attendance

Students are issued an in-class assessment task during one of their two weekly lectures, shown in figure 2. The task is usually easy and pertains directly to the content being presented. In-class assessments are worth 0.5% each, so are "worth doing."

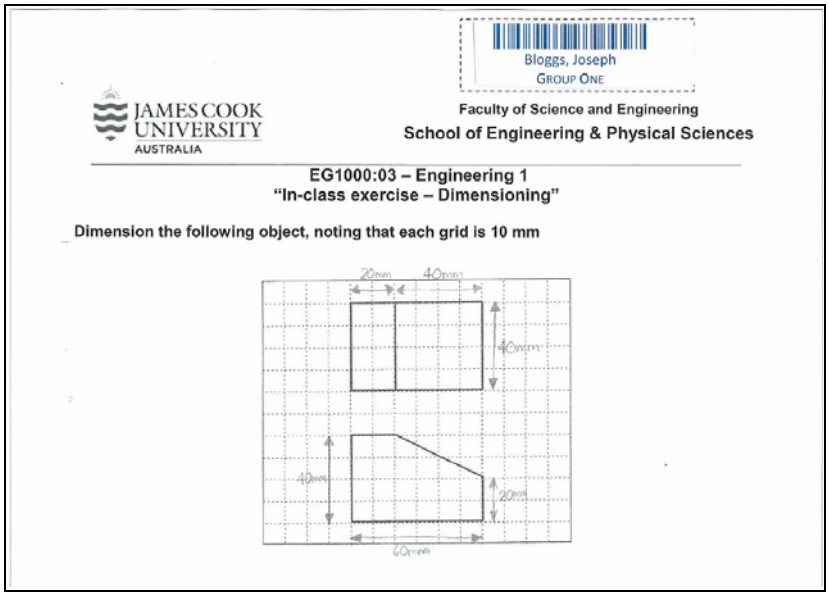

Figure 2 – Example of an in-class assessment.

In-class assessments are collected and scanned immediately following the lecture. Within a matter of minutes, a message can be e-mailed to those students who failed to attend. Figure 3 shows a typical example of such a message.

Date: Sun, 21 Mar 2010 00:33:09 +1000
From: Phil Schneider <phil.schneider@jcu.edu.au>
Subject: EG1000: lack of attendance Week 04

EG1000 student -

According to my records you did not attend the lecture on Friday of Week 04. Lecture attendance is one of the keys to passing this and other engineering subjects.

If you are having difficulties attending, due to unforeseen circumstances, then get back to me. You might also want to discuss matters with Phil Turner, the Associate Dean (Engineering) who can give you support and guidance.

- Phil Schneider

Figure 3 – Example e-mail sent to students who failed to attend.

Gauging participation

In similar fashion, each weekly assessment item is submitted during the following tutorial time (to further enhance attendance) along with a student identification sticker, as pictured in figure 4.

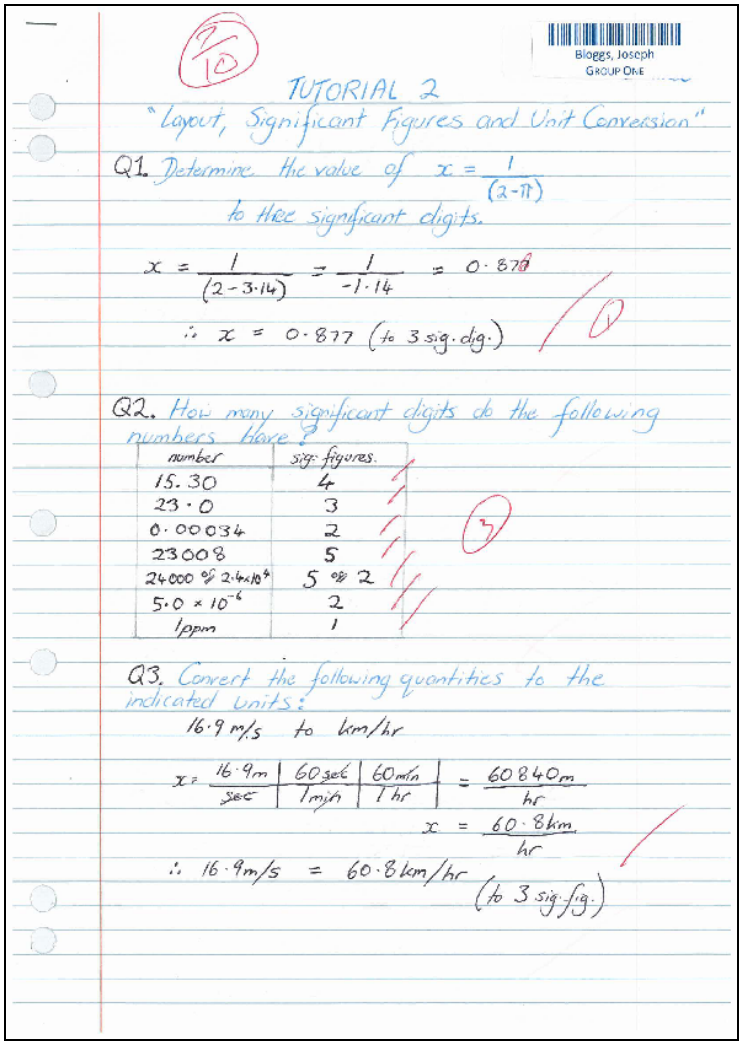

Figure 4 – Example of weekly assessment item (graded) with identification sticker.

Students who failed to submit are targeted with an e-mail similar to that shown in Figure 3, letting them know that they can still submit the assessment item and/or seek out academic or other advice. Students tend not to respond to these messages, but do make the effort to complete the outstanding item of assessment.

Outline of nuts and bolts session

Table 1 shows the proposed plan for the nuts and bolts session.

Time	**Item to be covered**
0 – 10 minutes	Presentation of background, development & implementation of system
10 – 20 minutes	Interactive session where session participant attendance and in-session participation will be gauged using the system. This will be a life demonstration of the technique.
20 – 30 minutes	Discussion on how this system could be best utilised in order to meet the needs of other programs.

Table 1 – Proposed timing of Nuts and Bolts session.

References

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